

CLAIMS

1. An implantable system (16) for anchoring stitching threads (2) within a bone tunnel (3), characterised in that it comprises an implantable device (1) and a complementary piece (17), the said device being formed by a single piece produced from bioresorbable material, and comprises:

- a sheath (4) arranged so as to receive at least one stitching thread (2); and
- a head (5) disposed at a proximal end (6) of the said sheath (4) and extending radially from the external wall (7) thereof;

the said piece being intended to be introduced into the sheath (4), so as, in a first position, to leave free the movement of the stitching threads (2) inside the sheath (4) and, in a second position, be able to block this movement.

2. A system according to Claim 1, characterised in that the external wall (7) of the sheath (4) comprises means of anchoring the device (1) in the bone tunnel (3).

3. A system according to Claim 1 or 2, characterised in that the sheath (4) is formed by an annular piece whose distal end (11) is frustoconical in shape, the said piece having an opening (12) with a substantially circular cross-section which passes right through on its longitudinal axis.

4. A system according to Claim 3, characterised in that the anchoring means are formed by at least one protrusion (13) in the form of a ring which extends radially on the external surface (7) of the annular piece.

5. A system according to any one of Claims 1 to 4, characterised in that the head (5) has a rectangular cross-section, the lower face (9) of the said head (5) forming an angle of substantially 45° with the longitudinal axis of the sheath (4).

6. A system according to any one of Claims 1 to 4, characterised in that the head (5) is rectangular in cross-section, the lower face (9) of the said head (5) forming an angle of substantially 90° with the longitudinal axis of the sheath (4).

7. A system according to any one of Claims 1 to 6, characterised in that the complementary piece (17) is formed by a cylindrical rod (18) whose cross-section is slightly less than the inside diameter of the sheath (4) and the distal part (19) of which is provided in the grooves (20) each intended to receive a stitching thread (2), the said grooves (20) being arranged so as on the one hand to separate the said threads (2) and on the other hand to guide their sliding inside the sheath (4).

8. A system according to Claim 7, characterised in that the distal part (19) comprises two grooves (20) extending in the longitudinal direction and over at least half of the total length of the rod (18).

9. A system according to any one of Claims 1 to 8, characterised in that a head (21) is provided on the proximal end of the rod (18), the said head (21) being intended on the one hand to participate in the wedging of the threads (2) when the rod (18) is in its second position and on the other hand to serve as a stop during the positioning of the rod (18) in the said second position.

10. A system according to Claim 9, characterised in that the proximal opening (22) in the sheath (4) and the head (21) of the rod (18) are conical in shape, the diameter of the head (21) being greater than that of the proximal opening (22), the angulation of the head (21) being substantially equal to or greater than that of the proximal opening (22) and the height of the head (21) being substantially equal to or less than the depth of the cone of the proximal opening (22).

11. A system according to Claim 10, characterised in that the angulations of the head (21) and of the proximal opening (22) are around 10° .

12. A system according to any one of Claims 1 to 11, characterised in that the device (1) and the complementary piece (17) are made from bioresorbable material, identical or not.

13. A system according to Claim 12, characterised in that the bioresorbable material comprises the polymers of high chemical purity, with a molecular mass greater than approximately 250,000 and of low polydispersity, for example less than 2.

14. A system according to Claim 13, characterised in that the bioresorbable material comprises the stereocopolymers of L- and D-lactic acids, the homopolymers of L-lactic acid, the copolymers of lactic acid and a compatible comonomer such as the derivatives of alphahydroxy acids, and the derivatives and/or mixtures of these substances.

15. A kit for anchoring stitching threads (2) inside a bone tunnel (3), comprising an implantable system (16) according to any one of Claims 1 to 14 and a device (24) for implanting the said system (16).

16. A kit according to Claim 15, characterised in that the implantation device (24) comprises:

- a piece (25) for actuating the complementary piece (17) from its first position to its second position;
- a tool (18) arranged to receive the implantable device (1), the stitching threads (2), the complementary piece (17) and the actuation piece (25), the said tool (18) comprising means of actuating the actuation piece (25);

so as to allow, when the complementary piece (17) is in its first position, the fitting of the system (16) within the bone tunnel (3) by causing it to slide on the stitching threads (2) to be fixed and then the locking of the stitching threads (2) by actuation of the complementary piece (17).

17. A kit according to Claim 16, characterised in that the tool (26) comprises a tube (27) in which the actuation piece (25) is slidably disposed, a handle (28) and a first trigger (29) making it possible to cause the movement of the actuation piece (25) within the tube (27) on a controlled channel.

18. A kit according to Claim 17, characterised in that the shape of the distal end (32) of the tube (27) corresponds substantially to the impression of the head (25) of the implantable device (1) so as to be able to house it.

19. A kit according to Claim 18, characterised in that the distal end (32) of the tube (27) also comprises two slots (33) disposed on each side of the tube (27), the said slots (33) being arranged so as to allow on the one hand the fitting and

passage of the stitching threads (2) and on the other hand to immobilise the implantable device (1) by snapping on.

20. A kit according to Claim 19, characterised in that two grooves (34) are provided on the external face of the tube (27) and in line with the two slots (33) so as to guide the stitching threads (2) outside the tube (27), a device for manipulating the threads (2) being provided close to the proximal end of the tube (27).

21. A kit according to Claim 20, characterised in that the manipulation device comprises:

- a second trigger (35) arranged on the handle (28) so as to be able to be actuated conjointly with the first (29);

- two lugs (36) disposed on each side of the handle (28) to allow the respective locking of a stitching thread (2) by winding;

so as to be able to exert a controlled traction on the threads (2) by actuation of the second trigger (35).

22. A kit according to any one of Claims 17 to 21, characterised in that the actuation piece (25) is cylindrical in shape, the diameter of which is substantially less than the inside diameter of the tube (27) and comprises two grooves (37, 38) machined radially on its surface close to its proximal end, the said grooves (37, 38) being arranged to cooperate with a system for locking the translation of the actuation piece (25) inside the tube (27), the said system comprising a pin (39) mounted on a spring (40) which is disposed in the handle (28) perpendicular to the movement of the actuation piece (25) so as to come to be engaged in one of the grooves (37, 38) in order to lock the translation.

23. A kit according to any one of Claims 16 to 22, characterised in that the distal end (41) of the actuation piece (25) is threaded so as to be able, prior to its arrangement in the tool (26), to associate with it the complementary piece (17) by threading the inside of the head (21) with a hole previously made in it.